

AIR QUALITY PERMIT

Issued To:	Bear Paw Energy, LLC	Permit: #3330-02
	Charlie Creek Compressor Station	Application Complete: 1/25/07
	1400 16 th Street, Suite 310	Preliminary Determination Issued: 2/8/07
	Denver, CO 80202	Department's Decision Issued: 2/26/07
		Permit Final:
		AFS: #083-0037

An air quality permit, with conditions, is hereby granted to Bear Paw Energy, LLC, Charlie Creek Compressor Station (Bear Paw), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

SECTION I: Permitted Facilities

A. Plant

Bear Paw operates a natural gas compressor station located approximately 20 miles northwest of Sidney, Montana, in the SW¹/₄ of the SE¹/₄ of Section 14, Township 24 North, Range 55 East, in Richland County, Montana. A complete list of the permitted equipment is contained in Section I.A of the permit analysis.

B. Current Permit Action

On January 25, 2007, the Montana Department of Environmental Quality (Department) received a complete application for permit modification from Bear Paw. Specifically, Bear Paw requested the removal of five permitted 530-brake horsepower (bhp) capacity Waukesha H24GL lean-burn natural gas compressor engines and the addition of a 1340-bhp Caterpillar G3516LE lean-burn natural gas compressor engine.

SECTION II: Conditions and Limitations

A. Operational and Emission Limitations

1. Bear Paw shall not operate more than three natural gas compressor engines at any given time (ARM 17.8.749).
2. Bear Paw shall not operate more than one natural gas compressor engine with a maximum rated design capacity of 1340-bhp (ARM 17.8.749).
3. The compressor engine described in Section II.A.2 shall be a lean-burn engine with a catalytic oxidation unit and an air-to-fuel ratio (AFR) controller. The pound per hour (lb/hr) emission limits for the engine shall be determined using the following equation and pollutant specific grams per horsepower-hour (g/bhp-hr) emission factors (ARM 17.8.752):

Equation

Emission Limit (lb/hr) = Emission Factor (g/bhp-hr) * maximum rated design capacity of engine (bhp) * 0.002205 lb/g

Emission Factors

Oxides of Nitrogen (NO_x): 1.5 g/bhp-hr
Carbon Monoxide (CO): 0.5 g/bhp-hr
Volatile Organic Compounds (VOC): 0.5 g/bhp-hr

4. Bear Paw shall not operate more than two natural gas compressor engines with a maximum rated design capacity of 1680-bhp per engine (ARM 17.8.749).
5. Each compressor engine described in Section II.A.4 shall be a rich-burn engine with an NSCR unit and an AFR controller. The lb/hr emission limits for each of the engines shall be determined using the following equation and pollutant specific g/bhp-hr emission factors (ARM 17.8.752):

Equation

Emission Limit (lb/hr) = Emission Factor (g/bhp-hr) * maximum rated design capacity of engine (bhp) * 0.002205 lb/g

Emission Factors

NO_x: 1.0 g/bhp-hr
CO: 2.0 g/bhp-hr
VOC: 0.5 g/bhp-hr

6. Bear Paw shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).
7. Bear Paw shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).
8. Bear Paw shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.7 (ARM 17.8.749).
9. Bear Paw's emergency flare shall be limited to 250 hours of operation during any rolling 12-month time period (ARM 17.8.749 and ARM 17.8.1204).

B. Testing Requirements

1. The 1340-bhp capacity lean-burn compressor engine described in Section II.A.2 shall be initially tested for NO_x and CO, concurrently, to demonstrate compliance with the emission limits as calculated in Sections II.A.3. The initial source testing shall be conducted within 180 days of the initial start up date of the engine. After the initial source test, additional testing shall continue on an every 4-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and ARM 17.8.749).
2. Bear Paw shall test the 1680-bhp capacity compressor engines described in Sections II.A.4 for NO_x and CO, concurrently, to demonstrate compliance with the NO_x and CO emission limits contained in Section II.A.5. Each engine shall be tested on an every 4-year basis or according to another testing/monitoring schedule as approved by the Department (ARM 17.8.105 and ARM 17.8.749).

3. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
4. The Department may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. Bear Paw shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis. Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).
2. Bear Paw shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).
3. All records compiled in accordance with this permit must be maintained by Bear Paw as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).
4. Bear Paw shall document, by month, the hours of operation of the emergency flare. By the 25th day of each month, Bear Paw shall total the flare operating hours during the previous 12 months to verify compliance with the limitation in Section II.A.9. A written report of the compliance verification shall be submitted along with the annual emission inventory (ARM 17.8.749).
5. Bear Paw shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit as required by ARM 17.8.1204(3)(b). The annual certification shall comply with the certification requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emission inventory information (ARM 17.8.1204 and ARM 17.8.1207).

D. Notification

Bear Paw shall provide the Department with written notification of the actual start-up date of the 1340-bhp capacity lean-burn compressor engine described in Section II.A.2 within 15 days after the actual start-up date (ARM 17.8.749).

SECTION III: General Conditions

- A. Inspection – Bear Paw shall allow the Department’s representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if Bear Paw fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Bear Paw of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.
- E. Appeals – Any person or persons jointly or severally adversely affected by the Department’s decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department’s decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department’s decision on the application is final 16 days after the Department’s decision is made.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.
- G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by Bear Paw may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Permit Analysis
Bear Paw Energy, LLC
Charlie Creek Compressor Station
Permit #3330-02

I. Introduction/Process Description

Bear Paw Energy, LLC, Charlie Creek Compressor Station (Bear Paw) is permitted for the construction and operation of a natural gas compressor station located in the Southeast ¼ of the Southwest ¼ of Section 14, Township 24 North, Range 55 East, in Richland County, Montana.

A. Permitted Equipment

The facility consists of the following equipment:

- A Caterpillar G3516LE lean-burn natural gas fired compressor engine with a maximum rated design capacity equal to or less than 1340-brake horsepower (bhp)
- Two Waukesha 7044 GSI rich-burn natural gas fired compressor engines with a maximum rated design capacity equal to or less than 1680-bhp per engine
- A glycol reboiler unit rated at 0.50 million British thermal units per hour (MMBtu/hr) capacity
- A still vent
- Two 0.25 MMBtu/hr heaters (Line and Building Heaters)
- Three 400 barrel (bbl) condensate storage tanks
- An emergency flare

B. Source Description

The Charlie Creek compressor station compresses and transports natural gas from nearby gas fields. The natural gas-fired compressor engines compress the gas for transmission through the pipeline.

C. Permit History

On July 24, 2004, Bear Paw was issued final air quality Permit **#3330-00** for the installation and operation of five Waukesha H24 GL natural gas fired compressor engines with a maximum rated design capacity of 530-bhp per engine, two building heaters, and three condensate storage tanks.

On October 28, 2004, the Montana Department of Environmental Quality (Department) issued a final permit modification to Bear Paw for the addition of two 1680-bhp Waukesha 7044 GSI rich-burn natural gas compressor engines utilizing non-selective catalytic reduction (NSCR) units and air-to-fuel ratio (AFR) controllers and the addition of a 0.50 MMBtu/hr glycol reboiler and still vent. Permit **#3330-01** replaced Permit #3330-00.

D. Current Permit Action

On January 25, 2007, the Department received a complete application for permit modification from Bear Paw. Specifically, Bear Paw requested the removal of five permitted 530-bhp capacity Waukesha H24GL lean-burn natural gas compressor engines and the addition of a 1340-bhp Caterpillar G3516LE lean-burn natural gas compressor engine. Permit **#3330-02** replaces Permit #3330-01.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

Bear Paw shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.
5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide

7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM₁₀

Bear Paw must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne Particulate Matter (PM). (2) Under this rule, Bear Paw shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.
3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.
4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.
5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. (4) Commencing July 1, 1972, no person shall burn liquid or solid fuels containing sulfur in excess of 1 pound of sulfur per million Btu fired. (5) Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions. Bear Paw will utilize natural gas in its fuel burning equipment, which will meet this limitation.
6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.
7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not an NSPS affected source because it does not meet the definition of any NSPS subpart defined in 40 CFR 60.

The Charlie Creek compressor station is not subject to 40 CFR 60, Subpart KKK, because it does not meet the definition of a natural gas processing plant as defined in this subpart. In addition, 40 CFR 60, Subpart LLL is not applicable to the compressor station because the facility does not utilize a sweetening unit to process sour gas.

8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. Owners or operators of oil and natural gas production facilities, as defined and applied in 40 CFR Part 63, shall comply with standards and provisions of 40 CFR Part 63, Subpart

HH. The Charlie Creek Compressor Station is not a National Emission Standards for Hazardous Air Pollutants (NESHAP) affected source because the facility is not a major source of Hazardous Air Pollutants (HAPs).

Owners or operators of natural gas transmission or storage facilities, as defined and applied in 40 CFR Part 63, shall comply with the standards and provisions of 40 CFR Part 63, Subpart HHH. The Charlie Creek Compressor Station is not a NESHAP affected source because the facility does not have a glycol dehydration unit. In addition, the source is not a major source of HAPs.

Owners or operators of facilities that utilize reciprocating internal combustion engines (RICE) and that are a major source of HAPs, as defined and applied in 40 CFR Part 63, shall comply with the standards and provisions of 40 CFR Part 63, Subpart ZZZZ. The Charlie Creek Compressor Station is not subject to the provisions of 40 CFR 63, Subpart ZZZZ because the facility is not a major source of HAPs.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.402 Requirements. Bear Paw must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed height of the new or altered stacks for the Charlie Creek Compressor Station is below the allowable 65-meter GEP stack height.

E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. Bear Paw submitted the appropriate permit application fee for the current permit action.
2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

F. ARM 17.8, Subchapter 7 – Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. Bear Paw has a PTE greater than 25 tons per year of oxides of nitrogen (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC); therefore, an air quality permit is required.
3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.
4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.
5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements.
(1) This rule requires that a permit application be submitted prior to installation, alteration or use of a source. Bear Paw submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. Bear Paw submitted an affidavit of publication of public notice for the December 6, 2006, issue of the *Sidney Herald*, a newspaper of general circulation in the Town of Sidney in Richland County, as proof of compliance with the public notice requirements.
6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.
7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The BACT analysis is included in Section III of this permit analysis.
8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.
9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Bear Paw of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*
10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.
11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
 13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.
 14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.
- G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:
1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.
 2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant (excluding fugitive emissions).

- H. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:
1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:
 - a. PTE > 100 tons/year of any pollutant;
 - b. PTE > 10 tons/year of any one HAP, PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or
 - c. PTE > 70 tons/year of PM₁₀ in a serious PM₁₀ nonattainment area.
 2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #3330-02 for Bear Paw, the following conclusions were made:
 - a. The facility's PTE is less than 100 tons/year for any pollutant. Permit #3330-02 includes federally enforceable limits to keep emissions below 100 tons/year.

- b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.
- c. This source is not located in a serious PM₁₀ nonattainment area.
- d. This facility is not subject to any current NSPS.
- e. This facility is not subject to any current NESHAP standards.
- f. This source is not a Title IV affected source, nor a solid waste combustion unit.
- g. This source is not an EPA designated Title V source.
- h. As allowed by ARM 17.8.1204(3), the Department may exempt a source from the requirement to obtain an air quality operating permit by establishing federally enforceable limitations which limit that source's potential to emit.
 - i. In applying for an exemption under this section, the owner or operator of the source shall certify to the Department that the source's potential to emit, does not require the source to obtain an air quality operating permit.
 - ii. Any source that obtains a federally enforceable limit on potential to emit shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit.

Bear Paw has taken federally enforceable permit limits to keep potential emissions below major source permitting thresholds. Therefore, the facility is not a major source and, thus a Title V operating permit is not required. The Department determined that the annual reporting requirements contained in the permit are sufficient to satisfy this requirement.

3. ARM 17.8.1207 Certification of Truth, Accuracy, and Completeness. Bear Paw shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit as required by ARM 17.8.1204 (3)(b). The annual certification shall comply with requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emission inventory information.

Based on these facts, the Department determined that Bear Paw is a minor source of emissions as defined under Title V.

III. BACT Determination

A BACT determination is required for each new or altered source. Bear Paw shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was submitted by Bear Paw for the current permit action addressing some available methods of controlling NO_x, CO, and VOC emissions from internal combustion (IC) engines used for the purpose of natural gas compression and transmission. The Department reviewed these methods, as well as previous BACT determinations in order to make the following BACT determination.

Introduction

Under the current permit action, Bear Paw proposed the construction and operation of a 1340-bhp capacity lean-burn Caterpillar 3516LE natural gas compressor engine. For the proposed project, Bear Paw will require an IC engine in the 1300-bhp capacity range. In the application for permit modification, Bear Paw identified two available lean-burn IC engines (1340-bhp Caterpillar 3516LE (proposed) and 1675-bhp Caterpillar 3520B) and one rich-burn IC engine (Waukesha 7044 GSI, 1680-bhp) within the bhp range required for the proposed project. Therefore, only the previously cited IC engines, and any available and technically feasible control strategies for those engines, have been considered in the BACT analysis for the proposed project.

A. IC Compressor Engines

1. CO BACT

The following CO control technologies/strategies were reviewed for BACT applicability under the current permit action:

- Lean-burn engine with a catalytic oxidation unit and an air-to-fuel ratio (AFR) controller
- Lean-burn engine with a catalytic oxidation unit
- Lean-burn engine with an AFR controller
- Lean-burn engine with a non-selective catalytic reduction (NSCR) unit and AFR controller
- Lean-burn engine with a NSCR unit
- Lean-burn engine with no additional controls
- Rich-burn engine with a NSCR unit and an AFR controller
- Rich-burn engine with a NSCR unit
- Rich-burn engine with an AFR controller
- Rich-burn engine with a catalytic oxidation unit and an AFR controller
- Rich-burn engine with a catalytic oxidation unit
- Rich-burn engine with no additional controls

Catalytic oxidation applied to a rich-burn engine is technically infeasible because the oxygen concentration from a rich-burn engine is not high enough for a catalytic oxidizer to operate properly. An NSCR unit applied to a lean-burn engine or lean-burn retrofit engine is also technically infeasible because the NSCR unit needs a rich fuel-to-air ratio to operate effectively.

The following Table ranks the remaining technically feasible control options in order of the highest control efficiency to the lowest control efficiency.

Control Technology	% Control	CO Emission Rate (g/bhp-hr)
Lean-Burn with Catalytic Oxidizer	83.3	0.5
Lean-Burn with Catalytic Oxidizer and AFR	83.3	0.5
Rich-Burn with NSCR and AFR	80.0	2.0
Rich-Burn with NSCR	80.0	2.0
Lean-Burn without Control or with AFR Only	---	3.0
Rich-Burn without Control or with AFR Only	---	10.0

The control methods listed above are widely used to reduce CO emissions from IC engines and cannot be ruled out based solely on environmental or energy impacts. Lean-burn engines do emit relatively higher HAP (formaldehyde) emissions than rich-burn engines. Lean-burn engines cannot be eliminated based on higher formaldehyde emissions, but the higher formaldehyde emissions can affect the BACT determination.

The table below provides a summary comparison of CO emissions and emission controls and control costs for the available IC engines.

Engine	Type	Control	Controlled CO Emission Rate (g/bhp-hr)	CO Reduction (ton/yr) ¹	CO Control Cost	CO Cost Effectiveness (\$/ton)
Caterpillar 3516LE (1340bhp)	LB	LB/OC	0.5	32.3	\$20,000	\$619
Caterpillar 3520B (1675bhp)	LB	LB/OC	0.5	40.4	\$20,000	\$495
Waukesha 7044GSI (1680bhp)	RB	NSCR/AFR	2.0	129.7	\$25,000	\$193
¹ Amount of CO controlled is difference between 10 g/bhp-hr minus the controlled value for rich burn engines and 3 g/bhp-hr minus the controlled value for lean-burn engines. LB = Lean-burn RB = Rich Burn OC = Oxidation Catalyst NSCR = Non-Selective Catalytic Reduction AFR = Air-to-Fuel Ration Controller						

Under the current permit action, Bear Paw proposed a 1340-bhp capacity lean-burn engine with an oxidation catalyst and an AFR controller. Based on the preceding analysis, the Department determined that a lean-burn IC engine with an oxidation catalyst and an AFR controller meeting an emission limit of 0.5 g/bhp-hr constitutes BACT for CO emissions, in this case. A lean-burn engine equipped with an oxidation catalyst and an AFR controller is frequently used in the natural gas compression industry and the BACT determination is consistent with other recently permitted similar sources.

2. NO_x BACT

The following NO_x control technologies/strategies were reviewed for BACT applicability under the current permit action:

- Lean-burn engine with a SCR unit and AFR controller
- Lean-burn engine with a SCR unit
- Lean-burn engine with an AFR controller
- Lean-burn engine with a NSCR unit and AFR controller
- Lean-burn engine with a NSCR unit
- Lean-burn engine with no additional controls
- Rich-burn engine with a NSCR unit and an AFR controller
- Rich-burn engine with a NSCR unit
- Rich-burn engine with an AFR controller
- Rich-burn engine with a SCR and an AFR controller
- Rich-burn engine with a SCR
- Rich-burn engine with no additional controls

SCR applied to rich-burn engines is technically infeasible because the oxygen concentration from rich-burn engines is not high enough for an SCR to operate properly. NSCR on lean-burn engines is technically infeasible because the engine must burn a rich fuel mixture for the NSCR to properly operate. Additional adverse environmental impacts could occur with an SCR unit operating on lean-burn engines at variable loads as required by a typical compressor engine. SCR units are typically installed on process units that have a constant or low variability in load fluctuation. When engine load changes excess ammonia (ammonia slip) may pass through the system and out the stack or not enough ammonia will be injected. SCR units have not been installed on lean-burn compressor engines in Montana. Due to technical difficulty and increased potential environmental

impact associated with the use of SCR technology on either rich or lean-burn engines, control strategies utilizing SCR technology have been eliminated from further consideration in this BACT analysis.

The following table ranks the remaining technically feasible NO_x control options in order of the highest control efficiency to the lowest control efficiency.

Control Technology	% Control	NO _x Emission Rate (g/bhp-hr)
Rich-Burn with NSCR and AFR	95.0	1.0
Rich-Burn with NSCR	95.0	1.0
Lean-Burn with AFR	25 to 50.0	1.0 to 1.5
Rich-Burn without Control or with AFR Only	0.0	20.0

The control methods listed above are widely used to reduce NO_x emissions from IC engines and cannot be eliminated based solely on environmental or energy impacts. Lean-burn engines do emit relatively higher HAP (formaldehyde) emissions than rich-burn engines. Lean-burn engines cannot be eliminated based on higher formaldehyde emissions, but the higher formaldehyde emissions can effect the BACT determination.

The table below provides a summary comparison of NO_x emissions and emission controls and control costs for the available IC engines.

Engine	Type	Control	Controlled NO _x Emission Rate (g/bhp-hr)	NO _x Reduction (ton/yr) ¹	NO _x Control Cost	NO _x Cost Effectiveness (\$/ton)
Caterpillar 3516LE (1340bhp)	LB	LB/OC	1.5	6.5	---	\$0
Caterpillar 3520B (1675bhp)	LB	LB/OC	1.0	16.2	---	\$0
Waukesha 7044GSI (1680bhp)	RB	NSCR/AFR	1.0	308.0	\$25,000	\$81
¹ Amount of NO _x controlled is difference between 20 g/bhp-hr minus the controlled value for rich burn engines and 2 g/bhp-hr minus the controlled value for lean-burn engines. LB = Lean-burn RB = Rich Burn OC = Oxidation Catalyst NSCR = Non-Selective Catalytic Reduction AFR = Air-to-Fuel Ratio Controller						

Under the current permit action, Bear Paw proposed a 1340-bhp capacity lean-burn engine with an oxidation catalyst and an AFR controller. Based on the preceding analysis and because Bear Paw requires a 1340-bhp engine for the proposed project, the Department determined that a lean-burn IC engine with an oxidation catalyst and an AFR controller meeting an emission limit of 1.5 g/bhp-hr constitutes BACT for NO_x emissions, in this case. A lean-burn engine equipped with an oxidation catalyst and an AFR controller is frequently used in the natural gas compression industry and the BACT determination is consistent with other recently permitted similar sources.

3. VOC BACT

The Department is not aware of any BACT determinations that have required controls for VOC emissions from natural gas-fired compressor engines, beyond the co-benefit control achieved through the installation and operation of CO controls. Bear Paw proposed the use of a lean-burn IC Engine with an oxidation catalyst and an AFR controller to meet a VOC lb/hr limit equivalent to 0.5 g/bhp-hr. The Department determined that no additional controls and burning pipeline quality natural gas to meet a VOC lb/hr emission limit equivalent to 0.5 g/bhp-hr constitute BACT for the proposed compressor engines.

4. PM₁₀ and SO₂ BACT

The Department is not aware of any BACT determinations that have required controls for PM₁₀ or SO₂ emissions from natural gas-fired compressor engines. Bear Paw proposed no additional controls and burning pipeline quality natural gas as BACT for PM₁₀ and SO₂ emissions from the proposed rich-burn IC engines. Due to the relatively small amount of PM₁₀ and SO₂ emissions from the proposed engines and the cost of adding additional control, any add-on controls would be cost prohibitive. Therefore, the Department determined that no additional controls and burning pipeline quality natural gas constitutes BACT for PM₁₀ and SO₂ emissions in this case.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

IV. Emission Inventory

Source	ton/year				
	PM ₁₀	NO _x	VOC	CO	SO _x
1340-bhp Caterpillar 3516LE Compressor Engine	0.003	19.41	6.47	6.47	0.02
1680-bhp Waukesha Compressor Engine	0.55	16.22	8.11	32.44	0.03
1680-bhp Waukesha Compressor Engine	0.55	16.22	8.11	32.44	0.03
Glycol Reboiler Unit (0.50 MMBtu/hr)	0.02	0.22	0.18	0.01	0.001
Still Vent	0.00	0.00	25.84	0.00	0.00
0.25 MMBtu/hr Building Heater	0.01	0.09	0.00	0.04	0.00
0.25 MMBtu/hr Line Heater	0.01	0.09	0.00	0.04	0.00
400 bbl Condensate Storage Tank #1	0.00	0.00	3.54	0.00	0.00
400 bbl Condensate Storage Tank #2	0.00	0.00	3.54	0.00	0.00
400 bbl Condensate Storage Tank #3	0.00	0.00	3.54	0.00	0.00
Emergency Flare (including flare pilot emissions)	0.00	3.72	7.66	20.23	0.00
Total	1.14	55.97	66.99	91.67	0.08

1340-bhp Compressor Engine

Brake Horsepower: 1340-bhp
Hours of Operation: 8760 hr/yr

PM₁₀ Emissions

Emission Factor: 7.71E-05 lb/MMBtu (AP-42, Chapter 3, Table 3.2-2, 7/00)
Fuel Consumption: 7.55 MMBtu/hr (Maximum Design – Company Information)
Calculations: 7.55 MMBtu/hr * 7.71E-05 lb/MMBtu = 0.00058 lb/hr
0.00058 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.003 ton/yr

NO_x Emissions

Emission factor: 1.50 gram/bhp-hour (BACT Determination)
Calculations: 1.50 gram/bhp-hour * 1340-bhp * 0.002205 lb/gram = 4.43 lb/hr
4.43 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 19.41 ton/yr

VOC Emissions

Emission factor: 0.50 gram/bhp-hour (BACT Determination)
Calculations: 0.50 gram/bhp-hour * 1340-bhp * 0.002205 lb/gram = 1.48 lb/hr
1.48 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 6.47 ton/yr

CO Emissions

Emission factor: 0.50 gram/bhp-hour (BACT Determination)
Calculations: 0.50 gram/bhp-hour * 1340-bhp * 0.002205 lb/gram = 1.48 lb/hr
1.48 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 6.47 ton/yr

SO₂ Emission

Emission factor: 5.88E-04 lb/MMBtu (AP-42, Chapter 3, Table 3.2-2, 7/00)
Fuel Consumption: 7.55 MMBtu/hr (Maximum Design – Company Information)
Calculations: $7.55 \text{ MMBtu/hr} * 5.88\text{E-}04 \text{ lb/MMBtu} = 0.004 \text{ lb/hr}$
 $0.004 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.02 \text{ ton/yr}$

1680-Hp Compressor Engines (2 Engines)

Brake Horsepower: 1680-bhp
Hours of Operation: 8760 hr/yr

PM₁₀ Emissions

Emission Factor: 9.50E-03 lb/MMBtu (AP-42, Chapter 3, Table 3.2-2, 7/00)
Fuel Consumption: 13.23 MMBtu/hr (Maximum Design – Company Information)
Calculations: $13.23 \text{ MMBtu/hr} * 9.5\text{E-}03 \text{ lb/MMBtu} = 0.13 \text{ lb/hr}$
 $0.13 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.55 \text{ ton/yr}$

NO_x Emissions

Emission factor: 1.00 gram/bhp-hour (BACT Determination)
Calculations: $1.00 \text{ gram/bhp-hour} * 1680\text{-bhp} * 0.002205 \text{ lb/gram} = 3.70 \text{ lb/hr}$
 $3.70 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 16.22 \text{ ton/yr}$

VOC Emissions

Emission factor: 0.50 gram/bhp-hour (BACT Determination)
Calculations: $0.50 \text{ gram/bhp-hour} * 1680\text{-bhp} * 0.002205 \text{ lb/gram} = 1.85 \text{ lb/hr}$
 $1.85 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 8.11 \text{ ton/yr}$

CO Emissions

Emission factor: 2.0 gram/bhp-hour (BACT Determination)
Calculations: $2.0 \text{ gram/bhp-hour} * 1680\text{-bhp} * 0.002205 \text{ lb/gram} = 7.41 \text{ lb/hr}$
 $7.41 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 32.44 \text{ ton/yr}$

SO₂ Emission

Emission factor: 5.88E-04 lb/MMBtu (AP-42, Chapter 3, Table 3.2-2, 7/00)
Fuel Consumption: 13.23 MMBtu/hr (Maximum Design – Company Information)
Calculations: $13.23 \text{ MMBtu/hr} * 5.88\text{E-}04 \text{ lb/MMBtu} = 0.008 \text{ lb/hr}$
 $0.008 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.3 \text{ ton/yr}$

Glycol Reboiler

Reboiler Heat Out-Put: 0.50 MMBtu/hr
Hours of Operation: 8760 hr/yr
Fuel Heating Value: 0.001 MMScf/MMBtu
Fuel Consumption: $0.5 \text{ MMBtu/hr} * 0.001 \text{ MMScf/MMBtu} * 8760 \text{ hr/yr} = 4.38 \text{ MMScf/yr}$

PM₁₀ Emissions

Emission Factor: 7.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 03/98)
Calculations: $7.6 \text{ lb/MMScf} * 4.38 \text{ MMScf/yr} * 0.0005 \text{ ton/lb} = 0.017 \text{ ton/yr}$

NO_x Emissions

Emission Factor: 100 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 03/98)
Calculations: $100 \text{ lb/MMScf} * 4.38 \text{ MMScf/yr} * 0.0005 \text{ ton/lb} = 0.219 \text{ ton/yr}$

VOC Emissions

Emission Factor: 5.5 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 03/98)
Calculations: $5.5 \text{ lb/MMScf} * 4.38 \text{ MMScf/yr} * 0.0005 \text{ ton/lb} = 0.012 \text{ ton/yr}$

CO Emissions

Emission Factor: 84 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 03/98)
Calculations: $84 \text{ lb/MMScf} * 4.38 \text{ MMScf/yr} * 0.0005 \text{ ton/lb} = 0.184 \text{ ton/yr}$

SO_x Emissions

Emission Factor: 0.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 03/98)
Calculations: $0.6 \text{ lb/MMScf} * 4.38 \text{ MMScf/yr} * 0.0005 \text{ ton/lb} = 0.001 \text{ ton/yr}$

Dehydrator Still Vent

Hours of Operation: 8760 hr/yr
Emission Factor: 5.90 lb/hr (GRI-GLYcalc, EPA Approved Still Vent Emission Estimation Program)
Calculations: $5.90 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 25.84 \text{ ton/yr}$

0.25 MMBtu/hr Heaters (2 Heaters)

Maximum Capacity: 0.25 MMBtu/hr
Hours of Operation: 8760 hr/yr
Max Fuel Useage: $0.25 \text{ MMBtu/hr} * 0.001 \text{ MMScf/l MMBtu} = 0.00025 \text{ MMScf/hr}$

PM₁₀ Emissions

Emission Factor: 7.60 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Calculations: $7.60 \text{ lb/MMScf} * 0.00025 \text{ MMScf/hr} = 0.002 \text{ lb/hr}$
 $0.002 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.01 \text{ ton/yr}$

NO_x Emissions

Emission factor: 94 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Calculations: $94 \text{ lb/MMScf} * 0.00025 \text{ MMScf/hr} = 0.02 \text{ lb/hr}$
 $0.02 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.09 \text{ ton/yr}$

VOC Emissions

Emission factor: 5.5 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Calculations: $5.5 \text{ lb/MMScf} * 0.00025 \text{ MMScf/hr} = 0.001 \text{ lb/hr}$
 $0.001 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.00 \text{ ton/yr}$

CO Emissions

Emission factor: 40 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Calculations: $40 \text{ lb/MMScf} * 0.00025 \text{ MMScf/hr} = 0.01 \text{ lb/hr}$
 $0.01 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.04 \text{ ton/yr}$

SO₂ Emission

Emission factor: 0.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Calculations: $0.6 \text{ lb/MMScf} * 0.00025 \text{ MMScf/hr} = 0.0002 \text{ lb/hr}$
 $0.0002 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.00 \text{ ton/yr}$

400 bbl Condensate Storage Tanks (3 Tanks)

VOC Emissions

Emission Factor: 7074.94 lb/yr (EPA Tanks, Version 4.0)
Calculations: $7074.94 \text{ lb/yr} * 0.0005 \text{ ton/lb} = 3.54 \text{ ton/yr}$

Emergency Flare

Operating Hours: 250 hr/yr (Permit Limit)

PM₁₀ Emissions (Soot)

Emission Factor: 0.00 lb/MMBtu (AP-42, Chapter 13, Table 13.5-1)
Calculations: $0.00 \text{ lb/MMBtu} * 1050 \text{ MMBtu/MMScf} * 10 \text{ MMScf/day} * 1 \text{ day/24 hr} = 0.00 \text{ lb/hr}$
 $0.00 \text{ lb/hr} * 250 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.00 \text{ ton/yr}$

NO_x Emissions

Emission Factor: 0.068 lb/MMBtu (AP-42, Chapter 13, Table 13.5-1)
Calculations: $0.068 \text{ lb/MMBtu} * 1050 \text{ MMBtu/MMScf} * 10 \text{ MMScf/day} * 1 \text{ day/24 hr} = 29.75 \text{ lb/hr}$
 $29.75 \text{ lb/hr} * 250 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 3.72 \text{ ton/yr}$

VOC Emissions

Emission Factor: 0.14 lb/MMBtu (AP-42, Chapter 13, Table 13.5-1)
Calculations: $0.14 \text{ lb/MMBtu} * 1050 \text{ MMBtu/MMScf} * 10 \text{ MMScf/day} * 1 \text{ day/24 hr} = 61.25 \text{ lb/hr}$
 $61.25 \text{ lb/hr} * 250 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 7.66 \text{ ton/yr}$

CO Emissions

Emission Factor: 0.37 lb/MMBtu (AP-42, Chapter 13, Table 13.5-1)
Calculations: $0.37 \text{ lb/MMBtu} * 1050 \text{ MMBtu/MMScf} * 10 \text{ MMScf/day} * 1 \text{ day/24 hr} = 161.88 \text{ lb/hr}$
 $161.88 \text{ lb/hr} * 250 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 20.23 \text{ ton/yr}$

Emergency Flare (Pilot)

PM₁₀ Emissions

Emission Factor: 7.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Fuel Consumption: 0.000044 MMScf/hr (Similar Source Determination)
Calculations: $7.6 \text{ lb/MMScf} * 0.000044 \text{ MMScf/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.001 \text{ ton/yr}$

NO_x Emissions

Emission Factor: 94 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Fuel Consumption: 0.000044 MMScf/hr (Similar Source Determination)
Calculations: $94 \text{ lb/MMScf} * 0.000044 \text{ MMScf/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.02 \text{ ton/yr}$

VOC Emissions

Emission Factor: 5.5 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Fuel Consumption: 0.000044 MMScf/hr (Similar Source Determination)
Calculations: $5.5 \text{ lb/MMScf} * 0.000044 \text{ MMScf/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.001 \text{ ton/yr}$

CO Emissions

Emission Factor: 40 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Fuel Consumption: 0.000044 MMScf/hr (Similar Source Determination)
Calculations: $40 \text{ lb/MMScf} * 0.000044 \text{ MMScf/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.01 \text{ ton/yr}$

SO_x Emissions

Emission Factor: 0.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Fuel Consumption: 0.000044 MMScf/hr (Similar Source Determination)
Calculations: $7.6 \text{ lb/MMScf} * 0.000044 \text{ MMScf/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.0001 \text{ ton/yr}$

V. Existing Air Quality

The compressor station is located in the SW¹/₄ of the SE¹/₄ of Section 14, Township 24 North, Range 55 East, in Richland County, Montana. The air quality of this area is classified as either Better than National Standards or Unclassifiable/Attainment for the National Ambient Air Quality Standards (NAAQS).

VI. Ambient Air Impact Analysis

The Department determined that the impact from this permitting action is minor. The Department believes the facility, operating under the limits and conditions included in this permit, will not cause or contribute to a violation of any applicable ambient air quality standard.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VIII. Montana Environmental Policy Act

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: Bear Paw Energy, LLC
Charlie Creek Compressor Station
1400 16th Street, Suite 310
Denver, Colorado 80202

Air Quality Permit Number: 3330-02

Preliminary Determination Issued: February 8, 2007

Department Decision Issued: February 26, 2007

Permit Final:

1. *Legal Description of Site:* Bear Paw's Charlie Creek Compressor Station is located approximately 20 miles northwest of Sidney, Montana, in the southwest ¼ of the southeast ¼ of Section 14, Township 24 North, Range 55 East, in Richland County, Montana.
2. *Description of Project:* Under the current permit action, Bear Paw would add a 1340-brake horsepower (bhp) capacity natural gas-fired lean-burn compressor engine. The permitted facility would consist of the proposed compressor engine, two 1680-bhp rich-burn natural gas fired compressor engines, a 0.50 MMBtu/hr capacity glycol reboiler, a dehydrator still vent, two natural gas-fired heaters (0.25 MMBtu/hr/heater), three condensate storage tanks (400 bbl/tank), and an emergency flare. The facility would receive natural gas from the nearby gas fields and compress the natural gas for transmission through the pipeline.
3. *Objectives of Project:* The proposed project would provide increased business and revenue for Bear Paw by allowing the company to more effectively gather and sell natural gas from the area. Natural gas would be received from nearby gas fields and the gas would be compressed for transmission through a natural gas sales pipeline.
4. *Alternatives Considered:* In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because Bear Paw demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.
5. *A Listing of Mitigation, Stipulations, and Other Controls:* A list of enforceable conditions, including a BACT analysis, would be included in Permit #3330-02.
6. *Regulatory Effects on Private Property:* The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites				X		Yes
J	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

Minor impacts to terrestrial and aquatic life and habitats would be expected from the proposed project because deer, antelope, coyotes, geese, ducks, and other terrestrials would potentially use the area around the facility and because the addition of the proposed equipment would result in air pollution from facility operations. The facility would emit air pollutants and corresponding deposition of pollutants would occur; however, as described in Section 7.F. of this EA, the Department determined that any impacts from deposition would be minor. In addition, because the proposed site of operation is an existing and previously permitted industrial site, the proposed changes would be consistent with existing operations and would therefore result in only minor and consistent impacts to any terrestrial and aquatic life and habitats located within the proposed area of operation. Overall, any impacts to terrestrial and aquatic life and habitats would be minor.

B. Water Quality, Quantity, and Distribution

Minor impacts would be expected on water quality, quantity, and distribution from the proposed project because the addition of the proposed equipment would result in air pollution from facility operations. The facility is a central compressor station, not a production field facility; therefore, no discharges into surface water would occur from operating the facility. However, minor amounts of water may be required to control fugitive dust emissions from the access roads and the general facility property. In addition, the facility would emit air pollutants and corresponding deposition of pollutants would occur; however, as described in Section 7.F. of this EA, the Department determined that any impact resulting from the deposition of pollutants would be minor.

Further, water quality, quantity, and distribution would not be impacted from constructing the facility because there is no surface water at or relatively close to the site and any minor construction activities would take place within the existing industrial site. Furthermore, no

discharges into surface water would occur and no use of surface water would be expected for facility construction. Therefore, no impacts to water quality, quantity, and distribution would be expected from facility construction. Overall, any impacts to water quality, quantity, and distribution would be minor.

C. Geology and Soil Quality, Stability, and Moisture

Minor impacts would occur on the geology and soil quality, stability, and moisture from the proposed project because minor construction would be required for the current project. However, construction activities would take place within an existing industrial site currently used for similar source operations. Since most of the infrastructure needed to accommodate the compression and transmission of natural gas (natural gas pipelines, access roads, etc.) would already be developed, any impacts would be minor. In addition, no discharges, other than minor air emissions, would occur at the facility as a result of the proposed project.

Further, deposition of pollutants would occur; however, as described in Section 7.F of this EA, the Department determined that any impacts resulting from the deposition of pollutants on the areas surrounding the site would be minor. Overall, any impacts to the geology and soil quality, stability, and moisture would be minor.

D. Vegetation Cover, Quantity, and Quality

Minor impacts would occur on vegetation cover, quantity, and quality because minor construction would be required to accommodate the proposed new equipment. Small buildings would be constructed; however, these buildings would be erected within an existing industrial site currently used for similar source operations. Since most of the infrastructure needed to accommodate the compression and transmission of natural gas (natural gas pipelines, access roads, etc.) would already be developed, any impacts would be minor. No discharges, other than minor air emissions, would occur as a result of the proposed new equipment at the facility.

Further, deposition of pollutants would occur as a result of the proposed project; however, as described in Section 7.F of this EA, the Department determined that any impacts resulting from the deposition of pollutants on the areas surrounding the site would be minor. Overall, any impacts to the vegetation cover, quantity, and quality in the area would be minor.

E. Aesthetics

Minor impacts would result on the aesthetic value of the area because the proposed project would require minor construction activities; however, construction activities would occur within an existing industrial site currently used for similar source operations. Since most of the infrastructure needed to accommodate the compression and transmission of natural gas (natural gas pipelines, access roads, etc.) would already be developed, any visual aesthetic impacts would be minor.

The proposed new equipment would also create noise in the area. However, any auditory aesthetic impacts would be minor because the engines would be located within a building in an area currently used for such industrial purposes. Overall, any aesthetic impacts would be minor.

F. Air Quality

The air quality of the area would realize minor impacts from the proposed project because the proposed project would result in the emission of the following air pollutants: PM₁₀; NO_x; CO; VOC (including HAPs); and SO_x. Air emissions from the facility would be minimized by limitations and conditions that would be included in Permit #3330-02. Conditions would

include, but would not be limited to, BACT emission limits, opacity limitations on the proposed engines, and opacity limitations on the general facility. In addition, based on previous analyses of similar sources operating under similar conditions, the Department believes that the emissions resulting from the proposed engines would exhibit good dispersion characteristics resulting in minor deposition impacts to the affected area.

Since controlled potential emissions from the proposed station would exhibit good dispersion characteristics and would not exceed any Montana ambient air quality modeling threshold, the Department believes that controlled emissions from the source would not cause or contribute to a violation of any ambient air quality standard. Therefore, any impacts to air quality from the proposed facility would be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

Recently, under the initial permitting action for this facility, in an effort to identify any unique endangered, fragile, or limited environmental resources in the area, the Department contacted the Montana Natural Heritage Program, Natural Resource Information System (NRIS). The NRIS search did not identify any known species of special concern located within the proposed project area. In this case, the project area was defined by the section, township, and range of the proposed location with an additional 1-mile buffer zone. Due to the minor amounts of construction that would be required, the relatively low levels of pollutants that would be emitted, and because the NRIS search did not identify any species of special concern in the area of the proposed facility, the Department determined that it would be unlikely that the proposed project would impact any species of special concern and that any potential impacts would be minor.

H. Demands on Environmental Resources of Water, Air, and Energy

The proposed project would have minor impacts on the demands for the environmental resources of air and water because the proposed project would result in the emission of air pollutants. Deposition of pollutants would occur as a result of operating the proposed equipment; however, as explained in Section 7.F of this EA, the Department determined that any impacts on air and water resources from the proposed project would be minor.

The proposed project would be expected to have minor impacts on the demand for the environmental resource of energy because power would be required at the site. Further, the proposed project would result in a minor impact to the non-renewable energy resource of natural gas in the proposed area of operation because the project would result in the compression and transfer of natural gas resulting in a reduction of that resource in the area. The impact on the demand for the environmental resource of energy would be minor because the proposed project would be consistent with existing operations at the site. Overall, the impacts for the demands on the environmental resources of water, air, and energy would be minor.

I. Historical and Archaeological Sites

Recently, under the initial permitting action for this facility, in an effort to identify any historical and archaeological sites located on or near the proposed project area, the Department contacted the Montana Historical Society, State Historic Preservation Office (SHPO). According to SHPO records, there are no previously recorded historic or archaeological sites within the proposed area. SHPO records also indicate that no cultural resource inventories have been conducted within the defined area. Therefore, SHPO recommends that, prior to any construction related ground disturbance, a cultural resource inventory be conducted for the purpose of determining if any such resources exist on or near the proposed site of operation. However, neither the Department nor SHPO has the authority to require that a cultural resource

inventory be conducted. Overall, due to the relatively small size and minimal ground disturbance required for construction of the facility, and the fact that the site is an existing industrial site, the Department determined that it is unlikely that the proposed project would have any impact on any historical and archaeological site.

J. Cumulative and Secondary Impacts

The cumulative and secondary impacts on the physical and biological aspects of the human environment in the immediate area would be minor due to the minor amount of construction activities associated with the proposed project and because the proposed project would be consistent with existing industrial operations at the proposed site. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #3330-02.

Increased additional facilities (production field facilities) would likely locate in the area to withdraw natural gas from the nearby area and supply the station with gas for dehydration, compression, and transmission. However, any future facility would be required to apply for and receive the appropriate permits from the appropriate regulating authority. Environmental impacts from any future facilities would be assessed through the appropriate permitting process. Overall, any cumulative and secondary impacts resulting from the proposed project would be minor.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The “no-action” alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores			X			Yes
B	Cultural Uniqueness and Diversity			X			Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production			X			Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities			X			Yes
G	Quantity and Distribution of Employment			X			Yes
H	Distribution of Population			X			Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity			X			Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

- A. Social Structures and Mores
- B. Cultural Uniqueness and Diversity

The proposed project would cause minor, if any, impacts to the social structures and mores and cultural uniqueness and diversity of the area because the proposed project would take place in a relatively remote location currently used for such industrial purposes. Further, the operation of a compressor station of this type, including the proposed project, necessitates relatively few employees for normal operations and would likely not result in any, or very little, immigration of new people to the area for employment purposes. Therefore, the proposed project would have little, if any, impact on the social structures and mores and cultural uniqueness and diversity in the area.

Additional activity (vehicle traffic, construction equipment, etc.) would be noticeable during construction activities associated with the proposed project; however, compressor stations, including the proposed new equipment, typically do not require day-to-day employees and once the project is constructed, activities associated with the operation of the facility would be minor. Overall, any impacts to the above social and economic resources in the area would be minor.

- C. Local and State Tax Base and Tax Revenue

The proposed project would result in minor impacts to the local and state tax base and tax revenue because relatively few or no new employees would be needed as a result of the proposed project. Further, the proposed project would necessitate relatively little construction and typically would not require an extended period of time for completion; therefore, any construction related jobs would be temporary and any corresponding impacts on the tax base/revenue of a given area would be minor. Overall, any impacts to the local and state tax base and tax revenue would be minor.

- D. Agricultural or Industrial Production

The land surrounding the proposed location is rural agricultural grazing land; however, the proposed site itself is currently used for industrial purposes consistent with the proposed project. Therefore, the proposed project would result in only minor, if any, impacts to agricultural production in the area. The proposed project would have minor impacts to industrial production in the area because the proposed project would add new equipment to an existing industrial source locating in an existing industrial area. However, because the proposed project would be relatively small by industrial standards, the project would likely not result in additional industrial sources (not directly associated with operations) moving to a given area.

Increased additional associated facilities (production field facilities) would likely locate in the area to withdraw the natural gas from the nearby area to supply the station with gas to be dehydrated and compressed for transmission through a natural gas pipeline. However, any future facility would be required to apply for and receive the appropriate permits from the appropriate regulating authority. Impacts from any future facilities would be assessed through the appropriate permitting process. Overall, any impacts to agricultural or industrial production of the area would be minor.

- E. Human Health

The proposed project would result in minor, if any, impacts to human health. As explained in Section 7.F of this EA, deposition of pollutants would occur; however, the Department determined that the proposed project would comply with all applicable air quality rules, regulations, and standards. These rules, regulations, and standards are designed to be protective of human health. Overall any impacts to human health would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

The proposed project would not impact any access to recreational and wilderness activities because the proposed project would occur at an existing industrial facility used for such purposes. The proposed project would have minor impacts on the quality of recreational and wilderness activities in the area because the proposed project, while relatively small by industrial standards, would be visible and would produce noise from the site. Overall any impacts to the access to and quality of recreational and wilderness activities in the area would be minor.

G. Quantity and Distribution of Employment

H. Distribution of Population

The proposed project would have minor, if any, impacts on the quantity and distribution of employment and the distribution of population in the area because relatively few, if any, additional permanent employees would be required for normal operations thereby resulting in relatively few, if any, new immigration to the area. In addition, temporary construction-related positions would result from this project but any impacts to the quantity and distribution of employment from construction related employment would be minor due to the relatively small size of the facility and the relatively short time period that would be required for constructing the proposed facility changes. Overall, any impacts to the quantity and distribution of employment and the distribution of population in the area would be minor.

I. Demands for Government Services

The project would result in minor impacts on the demands for government services because additional time would be required by government agencies to issue Permit #3330-02 and to assure compliance with applicable rules, standards, and conditions contained in Permit #3330-02. In addition, there would be minor impacts on the demands for government services to regulate the increase in vehicle traffic that would be associated with constructing and operating the proposed new equipment. The increase in vehicle traffic would be primarily during facility construction because compressor stations typically do not require day-to-day employees. Therefore, vehicle traffic would be relatively minor due to the relatively short time period that would be required to construct the proposed changes. Overall, any demands for government services to regulate the facility or activities associated with the facility would be minor due to the relatively small size of the facility.

J. Industrial and Commercial Activity

Only minor impacts would be expected on the local industrial and commercial activity because the proposed project would represent only a minor change in the industrial and commercial activity in the area. The proposed project would be relatively small and would take place at a relatively remote location currently used for such purposes.

Increased additional facilities (production field facilities) would likely locate in the area to withdraw the natural gas from the area and supply the station with gas to be dehydrated and compressed for transmission through a natural gas pipeline. However, any future facility would be required to apply for and receive the appropriate permits from the appropriate regulating authority. Impacts from any future facilities would be assessed through the appropriate permitting process. Overall, any impacts from the proposed project to industrial and commercial activity in the area would be minor.

K. Locally Adopted Environmental Plans and Goals

The Department is unaware of any locally adopted environmental plans or goals that would be affected by the proposed project. The permit would ensure compliance with state standards and goals.

L. Cumulative and Secondary Impacts

The cumulative and secondary impacts from this project would result in minor impacts to the economic and social aspects of the human environment in the immediate area. Due to the relatively small size of the project, the industrial production, employment, and tax revenue (etc.) impacts resulting from the proposed project would be minor. In addition, the Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #3330-02.

Increased additional facilities (production field facilities) would likely locate in the area to withdraw the natural gas from the area and supply the station with gas to be dehydrated and compressed for transmission through a natural gas pipeline. However, any future facility would be required to apply for and receive the appropriate permits from the appropriate regulating authority. Impacts from any future facilities would be assessed through the appropriate permitting process. Overall, any cumulative and secondary impacts resulting from the proposed project would be minor.

Recommendation: No Environmental Impact Statement (EIS) is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permit action is for the construction and operation of a natural gas central compressor station. This EA assesses the impacts specific to the proposed project. Permit #3330-02 would include conditions and limitations to ensure the facility would operate in compliance with all applicable air quality rules and regulations. In addition, there are no significant impacts associated with the proposed project.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office; Natural Resource Information System – Montana Natural Heritage Program.

Individuals or groups contributing to this EA: Montana Department of Environmental Quality; Montana Historical Society – State Historic Preservation Office; Natural Resource Information System – Montana Natural Heritage Program.

EA prepared by: M. Eric Merchant, MPH

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